

Remarks

The Examiner is thanked for the careful review of the application. Claims 1-24 are pending.

Rejections under 35 U.S.C. § 112

Claims 1, 9, 17, and 24 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants traverse this rejection.

The Office suggests that "it is unclear what a 'low K dielectric layer' encompasses" and further suggests that a particular range of dielectric constant must be clearly recited. Applicants respectfully submit that the term low K dielectric material is defined within the present application (e.g., p. 9 lines 16-18) as typically having a dielectric constant of between about 1.5 and 3.5. In addition, besides the fact that low K dielectric is defined in the specification, Applicants respectfully submit that those skilled in the art of semiconductor processing would know the meaning of a low K dielectric material. Therefore, Applicants submit that the term low K dielectric is not indefinite and request that the section 112 rejection be withdrawn for claims 1, 9, 17, and 24.

Claims 4, 6, 7, 15, 16, 22, 23, and 24 were rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants traverse this rejection.

The Office suggests that the basic of the combination ratio must be recited, e.g., atomic... Applicants respectfully submit that concentrations described as a percentage by weight is well known to those skilled in the art. In addition, Applicants further submit that describing concentrations of chemicals in a solution as a combination ratio is also well known to those skilled in the art. As a result, Applicants respectfully submit that those skilled in the art would understand the featured concentrations as claimed, and therefore,

respectfully submit that the section 112 rejection be withdrawn for claims 4, 6, 7, 15, 16, 22, 23, and 24.

Rejections under 35 U.S.C. § 103

Claims 1-24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Vyoda et al. (U.S. Pub. 2002/0105057) and Yoon (U.S. Pub. 2002/0090784). Applicants respectfully traverse this rejection. As will be fully explained below, AAPA in view of Vyoda and Yoon does not disclose each and every feature of independent claims 1, 9, 17, and 24 as required to raise a *prima facie* case of section 103 obviousness against independent claims 1, 9, 17, and 24. Applicants respectfully disagree with the assessments made in the Office Action and respectfully submit that, for at least the reasons discussed in the previous response to the Office Action and the reasons discussed below, the pending claims are allowable over the cited prior art.

Applicants respectfully submit that none of the cited prior art reference individually or in combination disclose or suggest all of the features of each of the independent claims. Specifically, none of the cited prior art references discloses or suggests removal of etching residues and ashing residues from a low K dielectric layer using a scrubbing action with a cleaning chemistry and a wetting agent.

First, the portions of the AAPA cited by the Office only discusses the prior art method of moving a wafer into a chemical bath containing liquids designed to remove the residue 27. The AAPA does not discuss or suggest usage of brushing or usage of both a cleaning chemistry and a wetting agent.

Second, the Office suggests that paragraph 20 of Vyvoda teaches the removal of residues from the low K dielectric layer by scrubbing. Applicants respectfully disagree with

this suggestion. The portion of Vyvoda cited by the Office discloses cleaning of residual slurry particles and metal contaminants in a post CMP operation. In contrast, the claimed inventions clean residues on low K dielectric layers from etching and ashing operations. Therefore, features of such a cleaning operation as taught by Vyvoda are not the same as the features of the claimed inventions.

Third, the Office attempts to suggest that the use of a surfactant is well-known to one of ordinary skill the art of making semiconductor devices and further suggests that "[I]t would have been obvious to one of ordinary skill in the art of making semiconductor devices to incorporate the known process into AAPA and Vyvoda's method to enable provision of the surfactant of AAPA and Vyvoda's." Applicants respectfully traverse this suggestion. To make a *prima facie* case of obviousness in a section 103 rejection, all features of the claimed inventions have to be disclosed or suggested by the prior art. Just because generic use of surfactants are well known does not mean that using cleaning chemistries and wetting agents with brushing to clean a low K dielectric layer is disclosed or suggested. Again, for a section 103 rejection, the cited prior art must disclose or suggest all of the features of the claimed invention. Applicants respectfully submit that the cited prior art references, individually or in combination, do not disclose or suggest all the elements of claim 1, 9, 17, and 24 as is required to raise a *prima facie* case of section 103 obviousness.

With regard to the dependent claims, the Applicants submit that the cited prior art references do not disclose all the elements of the dependent claims and traverse the rejection of those claims. In addition, the dependent claims are submitted to be patentable for at least the same reasons as independent claims 1, 9, 17, and 24 are patentable over the cited art of record. Consequently, Applicants respectfully request that the section 103 rejection be withdrawn.

Applicants respectfully submit that all of the pending claims are in condition for allowance. Accordingly, a notice of allowance is respectfully requested. If the Examiner has

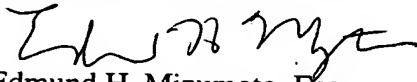
Appl. No. 10/033,644

Response to Office Action. Dated May 16, 2003

Reply to Office Action of January 16, 2003

any questions concerning the present paper, the Examiner is kindly requested to contact the undersigned at (408) 749-6900, ext. 6911. If any fees are due in connection with filing this amendment, the Commissioner is authorized to charge Deposit Account No. 50-0805 (Order No. LAM2P316). A duplicate copy of the transmittal is enclosed for this purpose.

Respectfully submitted,
MARTINE & PENILLA, L.L.P.


Edmund H. Mizumoto, Esq.
Reg. No. 46,938

710 Lakeway Drive, Suite 170
Sunnyvale, California 94085
(408) 749-6900